

Remarks

Section 112 Rejection

The Examiner rejected claim 5 under section 112 for a reference lacking proper antecedent basis. The claim has been amended to correct this error.

Section 103 Rejection

The Examiner rejected claims 1, 5-6, 9 and 13 under section 103(a) as being unpatentable over Isono, et al. 2003/0203244. The Examiner cited Isono as teaching a circumferentially textured glass substrate, a compressive stress layer (corresponding to a pre-seed layer), a first and second seed layer formed from a B2 material such as RuAl or NiAlB, a CrTi underlayer and a magnetic layer. (citing paragraphs 13-17, 74-75 and 89).

[0013] It is therefore an object of this invention to provide a magnetic recording medium which is capable of obtaining MrtOR of 1.2 or more so as to achieve a recording density of 40 Gbit/inch.^{sup.2} or more even if a glass substrate is used and which is excellent in shock resistance and low in production cost.

[0014] This invention has following structures.

[0015] A magnetic recording medium comprising: a glass substrate which has a principal surface and which includes a compressive stress layer as a surface layer having the principal surface; and a magnetic layer formed on the principal surface of the glass substrate; wherein:

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[0016] compressive stress produced on the principal surface of the glass substrate is equal to 3 kg/mm.sup.2 or more;

[0017] the glass substrate having the principal surface provided with a texture for inducing magnetic anisotropy in the magnetic layer;

. . .

[0074] For example, the seed layer is formed by an alloy having a bcc crystal structure or a B2 crystal structure, such as an Al alloy, a Cr alloy, an NiAl alloy, an NiAlB alloy, an AlRu alloy, an AlRuB alloy, an AlCo alloy, and an FeAl alloy, so that the magnetic grains can be miniaturized. Among others, the AlRu alloy, particularly, consisting of 30-70 at % Al and the balance Ru is preferable because of an excellent effect of miniaturizing the magnetic grains.

[0075] The underlying layer may be formed by a Cr alloy, a CrMo alloy, a CrV alloy, a CrW alloy, a CrTi alloy, or a Ti alloy to serve as a layer for adjusting the orientation of the magnetic layer. Among others, the CrW alloy, particularly, consisting of 5-40 at % W and the balance Cr is preferable because of an excellent effect of adjusting the orientation of the magnetic grains.

. . .

[0089] The seed layer 2 comprises a first seed layer 2a and a second seed layer 2b. Each of the seed layer 2 and the underlying layer 3 is a nonmagnetic layer. . . .

Isono goes on to state that:

[0091] . . . In each of the samples used herein, the seed layer 2 includes the first seed layer 2a comprising a Cr alloy thin film (having a thickness of 600 angstroms) and the second seed layer 2b comprising an AlRu thin film (having a thickness of 300 angstroms). The AlRu thin film has a composition of 50 at % Al and 50 at % Ru. . . .

[0144] The seed layer 2 includes the first seed layer 2a comprising a Cr alloy thin film (having a thickness of 400 angstroms) and the second seed layer 2b comprising an AlRu thin film (having a thickness of 300 angstroms). The AlRu thin film has a composition of 50 at % Al and 50 at % Ru.

Therefore, it is respectfully submitted that Isono does not teach or suggest the applicants' magnetic thin film layer structure in claim 1 comprising:

- a layer of RuAl;
- a layer of NiAlB epitaxially deposited on the layer of RuAl; and
- a ferromagnetic layer structure deposited after the layer of NiAlB.

Isono teaches only the use of chromium followed by a seed layer material such as RuAl. Applicants noted in their specification (see Table 1) that the addition of the NiAlB layer above the RuAl layer results in an improved performance over RuAl alone. This result is not suggested in anyway by Isono.

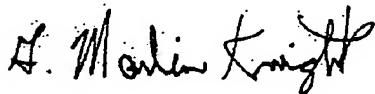
The Examiner rejected claims 15 and 18-19 under section 103(a) as being unpatentable over Isono, et al. 2003/0203244 in view of Abarra 6753101. The addition of Abarra does not cure the gaps discussed above in regard to the Isono reference. Claim 15 has been amended to more clearly distinguish over Isono.

The Examiner noted that claims 2-4, 7-8, 10-12, 14, 16-17 and 20 would be allowable if rewritten in independent form. Claim 9 has been amended to include the limitations of claim 10; therefore, it is believe that claim 9 is now allowable per the comments in the Office Action.

Conclusions

The applicants have amended independent claims 1, 9 and 15 to more particularly claim the invention and to more clearly distinguish over the cited references. Applicants respectfully submit that the cited references do not teach the claimed dual seed layer. Applicants, therefore, believe that all of the claims in application are allowable.

Respectfully submitted,



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